Ethernet Power Supply

3CNJPSE24

User s Guide

Contents

About this Guide

Purpose

This guide provides information and procedures on hardware installation, setup, configuration, and management of the Ethernet Power Supply.

Prerequisite Skills and Knowledge

The guide is intended for use by network administrators who are responsible for installing and setting up network equipment; consequently, a basic working knowledge of LANs (Local Area Networks) has been assumed.

To use this guide effectively, you should have a working knowledge of Ethernet infrastructures. In addition, you should:

— Have a working knowledge of basic electronics and mechanical assembly as well as an understanding of related local building codes.

— Be familiar with local operating and troubleshooting procedures.

Technical Support

3Com provides easy access to technical support information through a variety of services. This section describes these services.

Information contained in this section is correct at time of publication. For the most recent information, 3Com recommends that you access the 3Com Corporation World Wide Web site.

One-Year Free Installation Support

3Com provides free installation and troubleshooting telephone support for this product for 90 (ninety) days from the date of purchase.

Hours of operation are subject to change. See Support from 3Com later in this section.

Online Technical Services

3Com offers worldwide product support 24 hours a day, 7˚days a week, through the following online systems:

- World Wide Web site
- 3Com Knowledgebase Web Services
- 3Com FTP site

World Wide Web Site

To access the latest networking information on the 3Com Corporation World Wide Web site, enter this URL into your Internet browser: http://www.3com.com/

This service provides access to online support information, such as technical documentation and a software library, as well as support options that range from technical education to maintenance and professional services.

Knowledgebase Web Services

This interactive tool contains technical product information compiled by 3Com expert technical engineers around the°globe.°Located on the World Wide Web at http://knowledgebase.3com.com, this service gives all 3Com customers and partners complementary, around-the-clock access°to technical information on most 3Com products.

3Com FTP Site

Download drivers, patches, software, and MIBs across the Internet from the 3Com public FTP site. This service is available 24 hours a day, 7 days a week.

To connect to the 3Com FTP site, enter the following information into your FTP client:

- Host name: ftp.3com.com
- User name: anonymous
- Password: <your Internet e-mail address>

NOTE: You do not need a user name and password with Web browser software, such as Netscape Navigator and Microsoft Internet Explorer.

Support from Your Network Supplier

If you require additional assistance, consult your network supplier. Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

If you are unable to consult your network supplier, see the following section on how to contact 3Com.

Support from 3Com

If you are unable to obtain assistance from the 3Com online technical resources or from your network supplier, 3Com offers technical telephone support services. To find out more about your support options, call the 3Com technical telephone support phone number:

1 800 527 8677

When you contact 3Com for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

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Before you send a product directly to 3Com for repair, you must first obtain an authorization number. Products sent to 3Com without authorization numbers will be returned to the sender unopened, at the sender s expense. To obtain an authorization number, call:

1 800 527 8677

Introduction to the Ethernet Power Supply

1

This chapter contains introductory information about the Ethernet Power Supply and how it can be used in your network. It covers the following topics:

- About the Ethernet Power Supply

- Ethernet Power Supply   Front View Detail

- Ethernet Power Supply   Rear View Detail

- Network Configuration Examples

About the Ethernet Power Supply

The Ethernet Power Supply is a 24-port Ethernet-channel, 48V-power-feeding device. This device is designed for use with a 10/100BASE-TX standard Ethernet network over a standard TIA/EIA-568 Category 5 cabling plant. The DC operating power for the data terminal units is fed through the unused pairs (7/8 and 4/5).

The Ethernet Power Supply normally powers devices that are enabled for Power Over LAN or are equipped to receive power over Ethernet. These devices are called Powered Data Terminal Equipment (PDTE). Devices that are not equipped to receive power over Ethernet require local power or an external splitter to be powered by the Ethernet Power Supply.

NOTE: The Ethernet Power Supply is not a data hub or switch; it is a power distribution device to be used in conjunction with a data hub or switch. The Ethernet Power Supply adds power to unused wires and passes through data from the ports on an Ethernet or Fast Ethernet hub or switch using standard 8-wire, category 5 cables. Do not use crossover cables.

Ethernet Power Supply main features:

- Remote power feeding of Ethernet terminals
- No need for terminal s AC outlets, UPS and AC/DC adapters
- 24 10/100BASE-TX data plus power-combined channels
- Universal 100-240VAC, 50/60Hz power input
- Power management system
- Independent overload and short-circuit protection for each channel
- Port status indications
- Standard 19 1U rack mountable

Power Management System

The total power required by PDTEs may exceed the total power available from the Ethernet Power Supply. The Power Management System does not allow the total power output to exceed the maximum power available (200W). When the total power available is near maximum, attempts to connect an additional PDTE to an empty port causes the appropriate LED of the port to blink orange, indicating out-of-power budget and this port does not deliver power. Power distribution is based on first-come, first-served logic. Disconnection of other PDTEs or dropping the power use down on connected PDTEs so that the maximum power allowed for a single port is again available allows the connection of the new port automatically.

Should connected and operating PDTEs suddenly raise their power requirements significantly during operation, such that the power required exceeds the power available, the Ethernet Power Supply begins to turn off ports starting from port 24 down until the power is again inside the limit available. These ports resume operation when power is again available.

Ethernet Power Supply   Front View Detail

Data & Power output ports

Data input ports
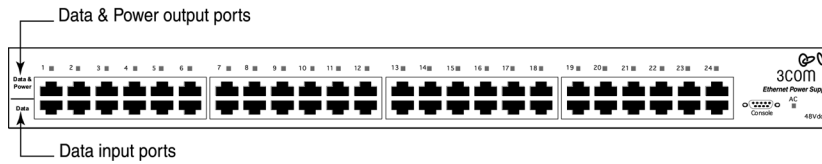
Figure 1   Ethernet Power Supply   Front View

10/100BASE-TX Data & Power Output Ports, Upper 24 Ports
The Ethernet Power Supply has 24 Data & Power ports
configured as Media Dependent Interface (MDI) non-crossover.
These ports are designed to carry Ethernet data over the
standard 2-wire pairs (RJ-45 pins 1/2 and 3/6) and DC power
source over the spare wire pair (RJ-45 pins 4/5 and 7/8).

10/100BASE-TX Data Input Ports, Lower 24 Ports
The Ethernet Power Supply has 24 10BASE-T/100BASE-TX-
data input ports, configured as MDI non-crossover. These ports
are designed to carry Ethernet Data only (TX/RX) over the
standard 2-wire pairs (RJ-45 pins 1/2 and 3/6).

According to the IEEE 802.3 standard, the maximum allowable
distance between two Ethernet links is 100m (328ft). The
Ethernet Power Supply meets this IEEE 802.3 requirement.

LEDS

The LEDs in the unit indicate status of the Ethernet Power Supply and its ports.

A main power LED on the front panel, marked by AC, provides the Ethernet Power Supply status. The "AC" LED illuminating green indicates that the Ethernet Power Supply is connected to an AC outlet. The AC LED illuminating orange indicates an internal fault. See tables 2 and 3.

One bi-color LED (green and orange) per port provides port status. The green color indicates that the terminal unit has been identified as "Power Over LAN enabled" and is active and receiving power.

The orange LED indicates the port is not supplying power and is not active. See Table 1 for additional information.

NOTE: In the event that an Ethernet device that is not Power Over LAN enabled is connected to the Ethernet Power Supply (indicated by the orange color or off), the Ethernet device is unaffected because power is not being supplied.

Ethernet Power Supply Status Indications

The following tables contain Ethernet Power Supply status information as presented on the front panel by the LED indicators during normal operation.

Table 1   Power Active (Green) and Power Not Active (Orange) - Port Status Indications

Port LED Color	Port Load Conditions	Port Voltage
Off	Non-active load, or unplugged port.	Power to the port is disconnected. No DC voltage is present on the spare pairs.
Green	Active load is plugged in and complies with normal load conditions.	Continuous nominal DC voltage is present on the spare pairs.
Orange	Overload conditions or shorted terminal port or forced external voltage feed (constant DC) into the port.	Power to the port is disconnected. No DC voltage is present on the spare pairs.
Green — Blinking	Transitional mode in which load detection is in process or discharged capacitor in the PDTE.	Power to the port is disconnected. No DC voltage is present on the spare pairs.
Orange — Blinking	Total aggregated power exceeds pre-defined power budget.	Power to the port is disconnected. No DC voltage is present on the spare pairs.

Table 2   Main Power Status Indications

LED Color	Main Power Status	Remarks
AC - Off	Internal power supply unit is unplugged or faulty.	Internal power supply voltage is too low. All ports are disconnected.
AC — Green	Indicates AC power input active.	Internal power supply voltage is within tolerance.
AC - Green Blinking	Internal power supply voltage is out of tolerance.	All ports are disconnected.
AC Orange	Internal problem alarm.	Built-in self-test failed.

For LED troubleshooting information, see Appendix C, Troubleshooting.

Ethernet Power Supply   Rear View Detail
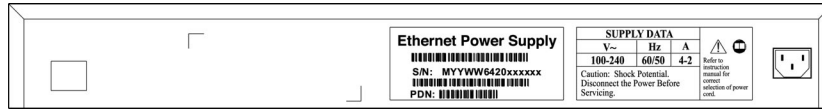
Figure 2   Ethernet Power Supply   Rear View

AC Power Receptacle

The Ethernet Power Supply automatically adjusts its power setting to any supply voltage in the range 100—240 VAC (60/50 Hz).

WARNING

Electrocution Hazard: Before connecting power to the Ethernet Power Supply, see Appendix A, Safety Information.

Installing the Ethernet Power Supply

2

Verifying Kit Contents

Unpack the kit and verify that the Ethernet Power Supply and user s guide (this manual) are present.

Recording Identification Information

Before proceeding with the Ethernet Power Supply placement and installation, record the serial number for future reference. The serial number is located on the information label on the rear of the Ethernet Power Supply.

Serial Number:

WARNING: Safety Information

You must read the safety information provided in Appendix˚A before carrying out any installation, removal or any maintenance procedure on the Ethernet Power Supply*.*

Powering Up

The following sections describe how to get the Ethernet Power Supply powered up and ready for operation.

⚠ **CAUTION**

The Ethernet Power Supply has no ON/OFF switch. To connect or disconnect power to the Ethernet Power Supply, insert or remove the power cable from the AC power receptacle on the rear of the Ethernet Power Supply.

1) Insert a power cord into the power socket on the rear of the Ethernet Power Supply.

2) Insert the other end of the power cord into the power receptacle.

The Ethernet Power Supply powers up and the internal fans begin operating.

The Ethernet Power Supply then runs through its power-on self-test (POST), which takes less than 10 seconds. During the POST, all ports on the Ethernet Power Supply are disabled and the LEDs light in the following sequence:

1) The AC LED lights.
2) All Port LEDs and the AC LED light for an LED test (green).
3) All Port LEDs and the AC LED light for an LED test (orange).
4) The AC LED lights and remains lit (depending on the input power source).
5) All ports are enabled for normal operation and the Ports LEDs are ready for indications (see Table 1).

Connecting Cables to the Ethernet Power Supply

All ports on the front of the Ethernet Power Supply are configured as data "route-through" ports for all data wires (pins 1, 2, 3, and 6).

Be sure to use a standard Category 5 straight-through cable including all 8 wires (4 pairs).

Data In Ports
Using a standard Category 5 straight-through cable, connect the cable leading from the Ethernet switch or hub to the "Data" port.

Data & Power Out Ports
Using a standard Category 5 straight-through cable, connect the cable leading to the end device to the corresponding "Data & Power" port.

NOTE: Be sure to connect correspondingly numbered "Data" and "Data & Power" ports.

Safety Information

A

Read the following safety information before performing any installation, removal, or maintenance procedure on the Ethernet Power Supply.

WARNING

Warnings contain directions that must be followed for personal and product safety. Follow all directions carefully.

WARNING

Read the installation instructions in Section 2 before connecting the Ethernet Power Supply to its power source.

WARNING

Follow basic electricity safety measures whenever connecting the Ethernet Power Supply to its power source.

WARNING

The Ethernet Power Supply chassis is intended to be grounded. Ensure the power host is connected to earth ground during normal use.

Ethernet Power Supply User s Guide   A-1

WARNING

This product relies on the building installation for short-circuit (overcurrent) protection. Make sure a fuse or circuit breaker no larger than 120VAC, 15A. U.S. (240VAC, 10A international) is used on the phase conductor.

WARNING

Do not work on the system or connect or disconnect cables during periods of lightning activity.

WARNING

A voltage mismatch can cause equipment damage and may pose a fire hazard. If the voltage indicated on the label is different from the power outlet voltage, do not connect the Ethernet Power Supply to this power outlet.

WARNING

For shelf-mounted equipment, make sure the surface is stable and strong enough to support the equipment. Do not stack more than four Ethernet Power Supply units on top of one another.

WARNING

Ultimate disposal of this product should be handled according to all national laws and regulations.

WARNING

The Ethernet Power Supply "Data" and "Data & Power" ports are shielded RJ-45 data sockets. They cannot be used as Plain Old Telephone Service (POTS) telephone sockets. Only RJ-45 data connectors may be connected to these sockets.

§ Installation and removal of the Ethernet Power Supply must be carried out by qualified personnel only.

§ Power Cord Set:
The power cord must be approved for the country in which it is used:

U.S.A. and Canada	§	The cord set must be UL-approved and CSA certified.
	§	The minimum specification for the flexible cord is: No. 18 AWG Type SV or SJ 3-conductor
	§	The cord set must have a rated current capacity of at least 10A.
	§	The attachment plug must be an earth-grounding type with a NEMA 5-15P (15A, 125V) or NEMA 6-15P (15A, 250V) configuration.
Denmark	§	The supply plug must comply with section 107-2-D1, standard DK2-1a or DK2-5a.
Switzerland	§	The supply plug must comply with SEV/ASE 1011.

§ The appliance coupler (the connector to the unit and not the wall plug) must have a configuration for mating with an EN60320/IEC320 appliance inlet.

§ The socket outlet must be near to the unit and easily accessible. You can only remove power from the unit by disconnecting the power cord from the outlet.

§ This unit operates under SELV (Safety Extra Low Voltage) conditions according to IEC 950. The conditions are maintained only if the equipment to which it is connected also operates under SELV conditions.

§ Switzerland only:
The supply plug must comply with SEV/ASE 1011.

§ France and Peru only:
This unit cannot be powered from IT supplies. If your supplies are of IT type, this unit must be powered by 230V (2P+T) via an isolation transformer ratio 1:1, with the secondary connection point labeled Neutral, connected directly to earth (ground).

Technical Specifications

B

Overview

This appendix lists Ethernet Power Supply hardware and electrical specifications.

Hardware Specifications

Physical Specifications

Dimensions	Height: 44mm, 1.75 in.
	Width: 433mm, 17 in.
	Depth: 302mm, 11.9 in.
Weight	4.0 Kg (8.8 lb)

Environmental Specifications

Mode	Temperature	Humidity
Operating	0 to 40¡C (32 to 104¡F)	10 to 90% (no condensation allowed)
Storage	-20 to 70¡C (-4 to 158¡F)	10 to 90% (no condensation allowed)

Electrical Specifications

Input voltage	90 to 264VAC (47-63Hz)
Input current at 110VAC	4 Amperes Max
Total output power	200 Watts Max
Output power, per port	16.8 Watts* (typ.)
Nominal output voltage, per port	44 - 57 VDC

* The output available per port may be lower depending on the power budget, which is controlled by the power management software module in the unit.

Ethernet Interface

Input (**Data In**): 24 Ports; Ethernet 10/100BASE-TX	RJ-45 female socket
Output (**Data & Power Out**): 24 Ports; Ethernet 10/100 BASE-TX, and 48 VDC	RJ-45 female socket, with DC voltage on pins 7/8 and 4/5

Troubleshooting

C

Introduction

This section helps you locate problems related to the Ethernet Power Supply setup and functionality.

This section provides a problem and resolution sequence to assist in troubleshooting minor operating problems. If the provided resolutions do not solve your problem, call 3Com for further assistance.

If you encounter problems, make sure:

— Power is applied to the Ethernet Power Supply.

— A crossover type Ethernet cable is not used.

— An *input* Ethernet cable is connected to the **Data** port.

— An *output* Ethernet cable is connected to the **Data & Power** port.

— The input and output cable pairs are attached to corresponding ports.

Troubleshooting Table

Problem	Resolution
The Ethernet Power Supply is plugged into a main AC outlet, but does not power up.	Verify the use of a correct and functional AC power cord, including good and solid ground connection. Verify the AC outlet is supplying power (test with a different device) and the voltage is between 100VAC and 240VAC (50Hz to 60Hz). Reconnect the Ethernet Power Supply to the AC outlet and verify the LEDs power up sequence. See the LEDs section earlier in this guide.
The Ethernet Power Supply is plugged in and running, but the fans are not working.	Verify all fan openings in the case are clear of any air-blocking materials. If fans are not working, there may be an internal power supply fault.
The Ethernet Power Supply operates, but the AC LED is off.	If both internal fans are working (that is, air flows out of the case or can be heard), there is a possible internal circuitry fault. If fans are not working, there may be an internal power supply fault.
The Ethernet Power Supply has powered up and the AC LED is orange.	See whether the power-on self-test (POST) sequence is as listed or not. If the LEDs light in the correct sequence, the Ethernet Power Supply is fully operational. If the problem remains following the POST sequence, the Ethernet Power Supply POST detected an internal fault. Contact 3Com.

Problem	Resolution
The "Port LED on one port is not lit and the corresponding end device does not operate.	The Ethernet Power Supply did not detect a connected end device and therefore the port is not providing power. Verify that: • The end device is Power Over LAN enabled. • You are using a standard UTP Category 5 cable, including all 8 wires (4 pairs). • If an external splitter is in use, replace it with a new splitter. Discard the faulty splitter. • You are not using a crossover twisted pair wire. • The end device is connected to the Data & Power port (upper RJ-45 connector). In addition, try to: • Re-connect the same end device into a different port on the same unit. If it works, there is probably a faulty port or RJ-45 connection. • Bypass the long twisted pair cable and bring the end device close to the Ethernet Power Supply and connect to one of the ports using a short cable. If this works, there is probably a faulty connection or short on the long cable, or one bad RJ-45 connection along the line. Connect the end device into a different Ethernet Power Supply. If this works, the Ethernet Power Supply is probably faulty. Try to power it up again and verify a correct power-up LED sequence.

Problem	Resolution
The end device operates, but there is no data link.	Verify that: • The Port LED on the Ethernet Power Supply front panel is lit continuously. • The "Data" and "Data & Power" ports correspond. • If an external splitter is in use, replace it with a new splitter. Discard the faulty splitter. • You are using a standard UTP Category 5 cable, including all 8 wires (4 pairs), and is 100m or less in length between the switch and the end device. • You are not using any crossover twisted pair wires. • The Ethernet Power Supply is connected to a switch or hub with a good RJ-45 patch cord connection. In addition, try to: • Bypass the long twisted pair cable and bring the end device close to the Ethernet Power Supply and connect to one of the ports using a short cable. If this works, there is probably a faulty connection or short on the long cable, or one bad RJ-45 connection along the line.

The end device operates, but there is no data link (continued).	• Connect a different end device to the same port. If this works and the link is established, there is probably a faulty data link in the end device. • Re-connect the end device to a different "Data & Power" port and remember to move the "Data" port of the switch or hub accordingly. If this works, there is probably a faulty "Data & Power & Power" or "Data" port in the Ethernet Power Supply or a bad RJ-45 connection
One of the ports is powering an end device without turning the Port LED on.	Re-connect the end device to a different "Data & Power" port. If the LED turns on, there is a fault in the previous output port (probably a faulty LED).
Is it safe to keep the Ethernet Power Supply running while the "Power Not Active" port LED is orange?	Yes, this condition is safe.

Limited Warranty and Regulatory Compliance Information

3Com Corporation Limited Warranty

This warranty applies to customers located in the United States, Australia, Canada (except Quebec), Ireland, New˚Zealand, U.K., and other English language countries, and countries for which a translation into the local language is not provided

Ethernet Power Supply

HARDWARE

3Com warrants to the end user ("Customer") that this hardware product will be substantially free from material defects in workmanship and materials, under normal use and service, for the following length of time from the date of purchase from 3Com or its authorized reseller:

One (1) year

3Com s sole obligation under this express warranty shall be, at 3Com s option and expense, to repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or if neither of the two foregoing options is reasonably available, refund to Customer the purchase price paid for the defective product. All products that are replaced will become the property of 3Com. Replacement products or parts may be new or reconditioned. 3Com warrants any replaced or repaired product or part for ninety (90) days from shipment, or the remainder of the initial warranty period, whichever is longer.

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3Com shall not be responsible for any software, firmware, information, or memory data of Customer contained in, stored on, or integrated with any products returned to 3Com for repair, whether under warranty or not.

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FCC Class A Verification Statement

WARNING: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules, and the Canadian Department of Communications Equipment Standards entitled, Digital Apparatus, ICES-003. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case, the user will be required to correct the interference at the user s own expense.

Changes or modifications not expressly approved by 3Com could void the user s authority to operate this equipment.

FCC Declaration of Conformity

Model   Description
3CNJPSE24   Ethernet Power Supply

to which this declaration relates, is in conformity with the following standards or other normative˚documents:

ANSI C63.4-1992 Methods of Measurement

Federal Communications Commission 47 CFR Part 15, subpart B

3Com Corporation, 5400 Bayfront Plaza, P.O. Box 58145, Santa Clara, CA 95052-8145